BOOM TRIKES

V2 Automatic

OWNER'S HANDBOOK

AND

SERVICE ITINERARY

Certificated Management System

BASIC VEHICLE INFORMATION

Fuel type:		95 octane
Fuel tank:	30 ltrs.	optionally 98 octane
Engine oil:	To check oil level screw down dipstick. Type of oil and grade:	Synthetic oil, SAE 5W/40
Oil capacity:	2.5 ltrs. (dry engine) 2.6 ltrs. (oil change with new oil filter) (see pages 23 + 24)	MIN – MAX = 0,3 ltr.
Gearbox oil :		SAE 75 W / 90 Fully synthetic oil
Tyre pressures: Cold tyres, pressures in bar = kp/cm^2		Front: 2.3
		Rear: 2.5
Cooling system	(capacity approx. 3.0 ltrs.)	Coolant to water ratio: 50:50
Tyre sizes:		Front: 170/60 x 17 or 200/50 x 17
		Rear: 295/50 x 15 or 295/35 x 18

Recommended lubricants, fluids and cleaning agents	
List of products and their uses	**Description**
Oil, differential gearbox	SAE 75 W 90
Pinion drive	AGIP Rotra 80 W 90
Oil for lubricate bowden cables (throttle cable)	Non-resinous oil
Grease (brake levers, throttle)	Heavy duty grease, MB265.1 equivalent
Engine oil	Synthetic engine oil, SAE 5 W 40, must exceed API SJ (Selenia HI Scooter 4 Tech)
Brake fluid	Synthetic brake fluid, SAE J1703, NHTSA 116 DOT 4, ISO 4925
Coolant	Monoethylene-based coolant, CUNA NC 956-16 Ensure coolant to water ratio is 50:50
Exhaust cleaner / polish	Special polish for cleaning and polishing stainless steel exhaust systems
Grease, steering head bearings and needle seats	Heavy duty grease, MB265.1 equivalent
Grease, camshaft sensor ring	Molybdenum sulphide / lithium soap grease compound
Fork oil (only Telescopic fork)	SAE 10 W fork oil, each tube 270 ml

FRAME AND ENGINE NUMBERS

The frame number is stamped on the right-hand side of the frame.
The engine number is stamped underneath the pinion drive at the rear.

IT IS ILLEGAL TO ALTER A FRAME NUMBER.
DOING SO MAY RENDER THE VEHICLE LIABLE TO CONFISCATION

Vehicle details

Model:	
Version:	
Vehicle frame no.:	
Date of first registratrion:	
Owner:	
Street:	
City/postal code:	
Phone:	
Key ID no.:	
Colour:	

Technical specifications

Cubic capacity:	839 c.c.
Power output:	51,8 kW (70,5 bhp) at 7750 rpm
Max. speed:	approx. 90 mph
No. of seats:	2
Length:	3475 cm
Width:	1600 – 1640 cm
Height:	1200 – 1440 cm
Basic vehicle weight:	550 kg
Vehicle load capacity:	Max. load capacity

Affix engine specification sheet here

Please present this handbook and service itinerary to your dealer whenever you bring the vehicle in for maintenance or servicing → **(summary of vehicle information for dealer)**

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SYMBOLS USED IN THIS HANDBOOK

OBSERVE PERSONAL SAFETY
CAUTION
Failure to observe these rules fully and correctly can seriously endanger your **personal safety and health**.

PROTECT THE ENVIRONMENT
CAUTION
The following are hints and tips to prevent use of the vehicle having a negative effect on the **environment**.

OBSERVE TECHNICAL SAFETY
CAUTION
Failure to observe these rules fully and correctly can seriously endanger the technical safety of the vehicle and may cause the conditions of the warranty to become void.

The symbols shown here are very important. Wherever they have been included in this handbook, they underline the importance of the passages to which they refer. In such cases even greater attention must be paid to the instructions given. Each symbol is distinct from the other, making it clear and easy to understand the type of information to which they refer.

4TH EDITION: SEPTEMBER 2009

GENERAL INFORMATION AND SAFETY CONSIDERATIONS

WHEN RIDING, ALWAYS ENSURE THAT YOU ARE FULLY IN CONTROL OF YOUR TRIKE . NEVER RIDE UNDER THE INFLUENCE OF ALCOHOL, DRUGS OR EVEN MEDICATION. FAILURE TO OBSERVE THIS RULE PUTS THE SAFETY OF YOUR OWN PERSON AND OF OTHERS SERIOUSLY AT RISK.

ANY MODIFICATIONS TO THE VEHICLE'S PERFORMANCE, OR TO ITS STRUCTURAL FEATURES, ARE ILLEGAL. IN SUCH CASES THE VEHICLE NO LONGER CORRESPONDS TO ITS ORIGINAL AND APPROVED SPECIFICATIONS, AND IS TECHNICALLY UNSAFE TO RIDE.

NOTE
NEVER ADJUST THE REAR-VIEW MIRRORS WHILE THE VEHICLE IS MOVING, AS YOU RISK LOSING CONTROL OF THE TRIKE.

TO AVOID ACCIDENTS, ALWAYS DRIVE VERY CAREFULLY WHEN YOU HAVE FITTED ACCESSORIES AND WHEN THE VEHICLE IS CARRYING LUGGAGE.
RIDING WITH ACCESSORIES AND WITH LUGGAGE MAY ADVERSELY AFFECT HANDLING CHARACTERISTICS, MAY REDUCE YOUR BOOM TRIKE'S PERFORMANCE, AND MAY LOWER THE LIMITS AT WHICH SAFE RIDING IS STILL POSSIBLE.
WITHOUT ACCESSORIES, RIDING SPEEDS CAN BE HIGHER, BUT YOU SHOULD ALWAYS KEEP WITHIN THE LEGALLY PRESCRIBED LIMIT. IF ACCESSORIES FROM MANUFACTURERS OTHER THAN FROM BOOM TRIKES HAVE BEEN FITTED, IF THE VEHICLE IS CARRYING HEAVY LOADS, IF IT IS POORLY MAINTAINED, OR IF ROAD AND WEATHER CONDITIONS DICTATE, REDUCE YOUR RIDING SPEEDS EVEN FURTHER.

SAFE LOADS AND ACCESSORIES

If you equip your trike with accessories and ride it carrying luggage, then great care must be taken to avoid accidents. Fitting accessory parts and riding with luggage can severely affect a trike's handling stability, vehicle performance and safe handling characteristics, and may require you to significantly reduce riding speeds. Consider also that the above effects on safe handling may become even worse if you fit accessories made by other manufacturers, if the loads you are carrying are distributed unevenly, if the tyres are worn, if the trike is poorly maintained, if road or weather conditions are bad etc. Always consider the above before you equip your trike with accessories or carry extra luggage.
Make sure that the combined weight of rider, passenger, luggage and accessories **does not exceed 180 kg**.

ACCESSORIES

Original BOOM TRIKES accessories have been specially developed and tested to be compatible with your trike. BOOM TRIKES have not tested any accessories made by other manufacturers for the effects that they may have on the handling characteristics of your vehicle.
It is therefore your responsibility to find out about the safety risks and any accident risk involved if you equip your trike with accessories made by other manufacturers.

Always observe the following:
1. Check the accessory part thoroughly to make sure that it does not cover up any lights, impair ground clearance, obstruct handlebar turns, or the use of any of the controls.
2. Accessory parts which modify the riding position, increasing the distance between hands and feet and controls, may delay a rider's reaction in a potentially dangerous road situation.
3. Do not fit any electrical parts which overload the trike's electrical system. If a fuse blows, resulting in night-time failure of lights, or if the engine cuts out in heavy traffic, a potentially dangerous situation may arise.

Caution:
Any modifications to the trike or removal of original parts may lead to the vehicle being unsafe to ride and may also contravene existing laws. Always observe all legal requirements.

CAUTION: PLEASE READ CAREFULLY

A trike is a fascinating vehicle. It gives its rider a feeling of freedom, with power at his fingertips. However, you should always be aware of and accept the limits which trike riding dictates. You should carry out regular care and maintenance as a matter of course, ensuring that your trike is always in perfect condition.
Take care not only of your trike, but also of yourself. When riding, you will only remain in control of your vehicle if you are healthy and if you feel healthy. Substances such as alcohol, drugs of any kind, including those medically prescribed, should always be kept out of play, all the more so when you are riding a trike. As a trike rider you must always be in top form. Consuming even minor quantities of alcohol increases the likelihood that you will take risks.
Riders of trikes and motorcycles should always choose the best in protective gear: at the very least a full-face helmet, a full leather suit, leather boots and a good pair of gloves should be worn. But do not let your biking gear tempt you into a false sense of security. Always remember: a good trike rider exercises caution. Always observe this rule to make sure you keep out of harm's way even if others make mistakes.

A trike is likely to handle in a way which is different to other road vehicles, especially in rainy or bad weather conditions. Only an experienced car driver / motorcycle rider should take charge of a trike. We urgently recommend that you take part in a trike rider's safety course.

Note:
When you sell your trike, please be sure to pass this handbook on to the new owner

Before you take your trike out on the road always check:

- Oil and coolant levels
- Tyre pressures
- The amount of fuel in the tank

Before you take your trike out on the road always check the brake fluid level.
Also check the vehicle to ensure that it is in roadworthy condition, that the lights are in working order, and that all external parts are properly secured.
Polish chrome parts regularly using an appropriate cleaner, as otherwise the warranty on these parts of the vehicle will become void. All aluminium parts are highly susceptible to corrosion, and depending on the degree to which the vehicle is exposed to salt in the atmosphere, or to other corrosive influences, will require more or less frequent cleaning.
As a result of continuous improvement to BOOM trikes, certain details of your trike may deviate from the specifications contained in this handbook.

SAFETY FIRST

The following is a brief guide to safe and carefree everyday riding. Your knowledge of the vehicle and your riding abilities are the key to ensuring that you travel the roads safely. Try the vehicle out on quiet roads with only occasional traffic until you are confident that you know how to ride the trike well.

1. Always wear a helmet.
2. When travelling on bad roads ride slowly and with caution.
3. Long journeys on wet roads without use of the brakes will cause braking performance to be weak at first. In such road conditions regularly operate the brakes to avoid this effect.
4. Do not carry out emergency stops on wet roads, or on loose or slippery surfaces.
5. Use of the vehicle on sand, muddy surfaces or on roads in wintery conditions: we recommend that you regularly clean the brake discs with a light cleaning agent, to avoid dirt collecting in the perforations which will otherwise accelerate brake pad wear.

2.1 CONTROLS, SWITCHGEAR, WARNING LIGHTS AND INSTRUMENTS

Handlebar controls: (Fig. 1)

Functions:

1. Headlight flasher (at front)
2. Light switch
3. Parking light
4. Dipped beam
5. Main beam
6. Horn
7. Indicator

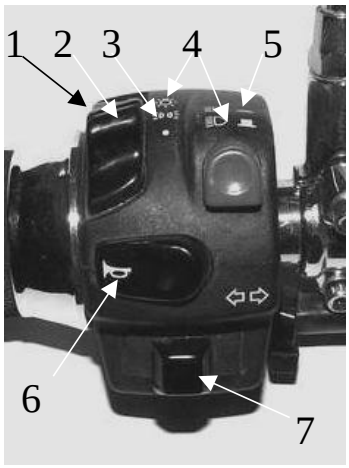


Fig. 1

Fuel tank instruments / standard specifications (Fig. 2):

1. Ignition switch
2. Water temperature gauge (standard specifications only)
3. Rear fog light switch
4. Hazard warning light switch
5. Brake fluid warning light

Fig. 2

Instruments unit:

1. Speedometer
2. Tripometer
3. Fuel gauge
4. Indicator warning light
5. Oil pressure warning light
6. Main beam warning light
7. Alternator / engine fault warning light
8. Rev counter

Fig. 3

KNOW YOUR WARNING LIGHTS

A few seconds after you have started the engine the oil pressure warning light (red) should go off. If it stays on, stop the engine immediately and check the engine oil level. Running the vehicle with insufficient oil pressure can cause severe damage to the engine.

BRAKE FLUID WARNING LIGHT

If this light goes on, top up the brake fluid reservoir to the “Max” marking immediately. Take the vehicle to your nearest BOOM TRIKES dealer or any other specialist dealer to carry out a check on the braking system. Stop the vehicle immediately and have it towed!

ALTERNATOR / ENGINE FAULT WARNING LIGHT

A few seconds after you have started the engine this light must go off. If it does not go off, or if it lights up while you are riding the vehicle, stop the engine immediately and take the vehicle to your nearest BOOM TRIKES dealer or specialist workshop.

2.2 PARKING LOCK

To activate the parking lock, turn the handlebars to the right. Insert the key, turning the barrel of the lock to the right, press and then lock. To unlock it, insert the key and proceed in reverse order. (Fig. 4).

Fig. 4

PROTECTING YOUR TRIKE AGAINST THEFT

1. Always activate the parking lock and never leave the ignition key unattended in the switch. Obvious though these precautions are, they are equally easy to forget.

2. Make sure that your vehicle documents are complete and up to date. Carry them with you but never leave them unattended onboard the vehicle.

3. If possible, lock your vehicle in an enclosed garage space.

4. Write down your name, address and telephone number in this handbook.

2.3 CHECKS BEFORE YOU RIDE YOUR TRIKE

Caution: Failure to observe the section "Checks before you ride your trike" can lead to accidents or damage to the vehicle.

Check your trike regularly before you ride it. The checks listed below take very little time to complete and in the long run will save you time and help to protect both your wallet and your life.

1. Engine oil level: Check the oil level and if necessary top up.
   Check the engine for oil leaks.

2. Fuel: Always refuel in good time.
   Check the fuel lines for leaks.

3. Front/rear brakes: Check that the brakes are in good working order.
   Ensure that there are no brake fluid leaks.

4. Tyres: Check the tyre pressures and the condition of the tyres.

5. Throttle: Ensure throttle action remains smooth when turning the handlebars from lock to lock.

6. Lighting equipment and horn: Check that headlamp, tail light, brake light, indicators, warning lights and horn are in proper working order.

Caution: Never let the engine run in an enclosed space. Exhaust fumes contain poisonous carbon monoxide which can lead to a loss of consciousness and ultimately cause death.

Never press the electric starter button for longer than 5 seconds at a time. Always wait for at least 10 seconds before attempting to start the engine again.

2.4 RUNNING IN

Run the vehicle in over the first 650 miles / 1000 km. Use only a moderate throttle during this period, and do not overrev. Vary engine speeds, avoid maintaining them constant.

Never use full throttle while running the engine in.

Only briefly warm up the engine at idling speed. Avoid travelling short distances, as otherwise the engine will not reach its correct running temperature.

2.5 STARTING THE ENGINE

This vehicle is equipped with an ignition cutout operated by the handbrake. If the handbrake is on, then the engine will not start.

This vehicle is equipped with a CVT automatic gearbox which engages directly with the rear wheels. When starting the engine, you must press the footbrake and the throttle must be shut. After the engine has started, release the footbrake and gently open the throttle.

The fuel injection system also comprises a vacuum pump and a choke which automatically assist engine starts.

EVEN SLIGHTLY OPENING THE THROTTLE WILL CAUSE THE AUTOMATIC GEARBOX TO TURN THE REAR WHEELS. AFTER STARTING, RELEASE THE FOOTBRAKE VERY SLOWLY AND GENTLY OPEN THE THROTTLE.

When you start the engine, the fuel injection system takes into account the engine temperature, ambient temperatures, and surrounding air pressure.

STARTING DIFFICULTIES
In the unlikely event of starting difficulties caused by fuel flooding the engine, try to start the engine by partially or fully opening the throttle. However, you should contact a specialist dealer to find the fault and rectify it, to ensure that the engine starts correctly again.

STOPPING THE ENGINE
Close the throttle and turn the ignition key to the OFF position. Remove the key.

PRECAUTIONS

TO AVOID DAMAGING THE ENGINE, NEVER RUN HIGH ENGINE SPEEDS AFTER A COLD START. WHEN TRAVELLING DOWNHILL TAKE CARE NOT TO EXCEED THE VEHICLE'S THE MAXIMUM SPEED. IF YOU EXCEED MAXIMUM ENGINE SPEED THEN A GOVERNOR WILL BE ACTIVATED TO PROTECT THE ENGINE FROM DAMAGE.

IF YOU HAVE RIDDEN A LONG DISTANCE AT MAXIMUM SPEED, NEVER STOP THE ENGINE IMMEDIATELY AFTERWARDS. LET THE ENGINE IDLE IN NEUTRAL FOR A FEW SECONDS FIRST.

CARRYING OUT ALTERATIONS MAY CAUSE SEVERE DAMAGE TO THE ENGINE. TUNING MEASURES OR ANY OTHER MODIFICATIONS TO EITHER THE ENGINE, THE CVT AUTOMATIC GEARBOX, OR TO THE VEHICLE ITSELF WILL INVALIDATE THE VEHICLE'S WARRANTY.

2.6 AUTOMATIC GEARBOX

The V2 is equipped with a CVT automatic gearbox.

A) Automatically transmission

To ensure the most comfortable ride possible the vehicle is equipped with an automatic gearbox, a centrifugal clutch and electronic engine management. This system was developed to obtain best possible acceleration and lowest possible fuel consumption both on even roads and up hills. If you stop the vehicle when travelling up a hill, e.g. at traffic lights or in a line of traffic, use only the brakes to keep the vehicle from rolling away. Do not open the throttle, instead let the engine idle.

If you use the engine to stop the vehicle from rolling backwards, due to excessive friction this can cause the clutch to overheat.

Avoid clutch friction over long periods. Other than in the situation described above, this can occur when on full throttle up steep hills, or when moving off on a steep hill with a passenger and luggage.

In the event of the clutch overheating observe the following precautions:
1. Do not ride the vehicle under these conditions over a long period.
2. If the clutch overheats, then let the engine idle in neutral for a few minutes to allow the clutch to cool down.

2.7 FRAME, FRONT FORK, REAR DAMPERS, REAR AXLE

A) Front fork (maintenance-free)

b) Teleskopic fork

Front suspension is by a hydraulically operated telescopic fork. If the fork seals are no longer oiltight, then take the trike to a specialist dealer to carry out repairs. As the front fork is a safety-relevant part, if problems occur we urgently recommend that you contact your specialist. The front fork is a non-adjustable unit.
Each fork leg contains 270 c.c. of SAE 10W fork oil, which should be changed every 3 years.

B) Rear dampers

Fig. 5

The standard spring pre-load on the rear dampers offers an optimum compromise for riding either on your own or with a passenger, and in both of these cases no further adjustment is required.

However, if most of the time the trike carries a passenger and large amounts of luggage, then adjust the pre-load to a higher setting.

ADJUSTING THE REAR DAMPERS
An adjuster wheel at the lower end of the unit allows continuous adjustment of the spring pre-load.

SPRING PRE-LOAD WHICH IS INCORRECT FOR THE RESPECTIVE WEIGHT OF THE VEHICLE CAN IMPAIR THE QUALITY OF THE RIDE AND MAKE IT UNSAFE TO USE THE TRIKE.

TO AVOID INJURY OR ACCIDENTS, WEAR PROTECTIVE GLOVES WHENEVER YOU ADJUST THE DAMPERS.

ALWAYS ADJUST BOTH DAMPERS TO EXACTLY THE SAME SETTING.

C) Rear axle

The rear axle is equipped with alloy swinging arms on either side. Snail cam adjusters A+B allow you to set toe-in and camber.

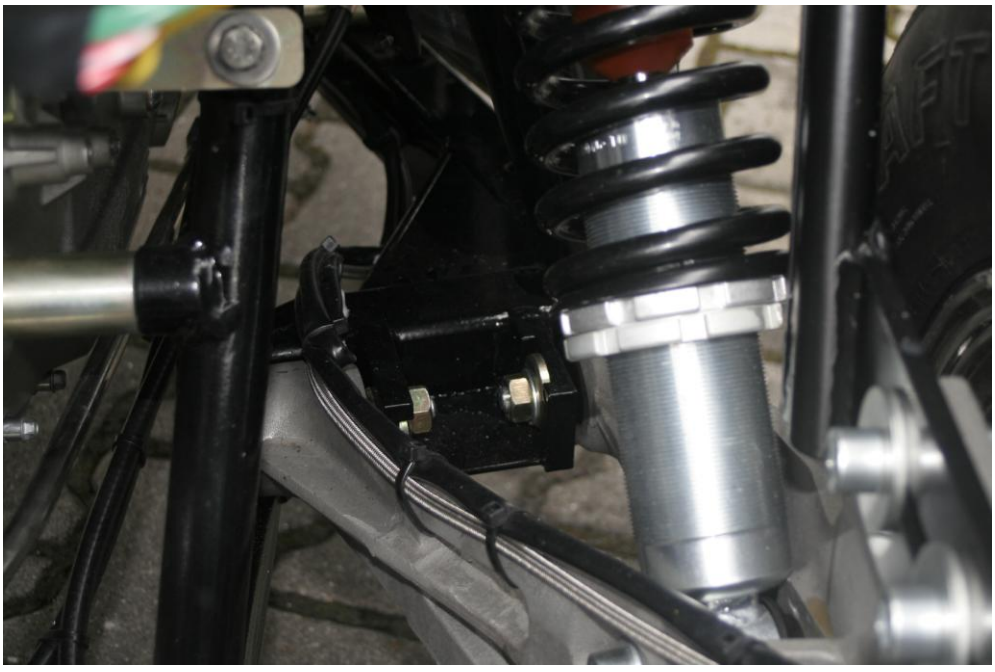
All V2-Trikes are set up correctly at the factory and will normally need no further adjustment.
The factory settings are:

Toe-in: - 0° 10‘ to - 0° 15‘

Camber: 0°10‘

If tyre wear is uneven, then please contact a specialist dealer who can check camber and toe-in and if required make the necessary adjustments.

Fig. 6



2.8 BODYWORK

The bodywork is made of ABS plastic. When cleaning please observe the following:

Fig. 7

Do not use petrol or spirits.

We recommend an anti-static spray cleaner for plastic surfaces.
Spray the surfaces and wipe them dry with a soft, lint-free rag.
This will avoid a buildup of static and prevent
dust particles from collecting on the surface.
Normally available in 500 ml bottles.

This spray cleaner is available from your BOOM trikes dealer.

We also recommend that you use a soft rag to clean other plastic parts – not a microfibre rag – and that you do not use sponges or rags which have rough cleaning surfaces.

Fig. 8

Fig. 9

To lift up the body section, press the release lever which unlocks it (Fig. 8).

After unlocking, press the body section up. The liftomatic holds it in place.

To lower the body section, first press the body up to release the locking mechanism of the liftomatic.

Fig. 10

Make sure that the handlebars are straight, i.e. the front wheel is pointing straight ahead, and that the handbrake is on. Otherwise you will be unable to lift up the body section fully, and will also risk damaging it.

Caution:

Whenever you ride the trike and whenever you tow the vehicle on an open trailer the body section must always be shut (using the liftomatic mechanism, or having secured it with bolts). When you close the body section make sure to lower it slowly, evenly and towards the centre of the vehicle, as otherwise you risk damaging the bodywork or the side covers.

3.0 BRAKING SYSTEM

A) BRAKE PEDAL

Fig. 11

To adjust the brake pedal, remove splint and unscrew the nut. With the aid of the existing holes you can adjust pedal and the foot rest according to the size. Unscrew the nut at the foot rest and remove the screw. Now you can adjust the foot rest.

Make sure you have enough ground clearance!

B) FRONT DISK

The front brake, operated by the integral braking system, is a legal requirement. Unlike a motorcycle, 80 % of braking loads are transmitted to the rear wheels, even at high speeds. Nevertheless, you should regularly check the front brake for wear, and the brake lines for any leakages.

Caution: The braking system should be maintained and repaired by specialist dealers only.

C) REAR BRAKE

Fig. 12

Wear to the brake pads and the discs is compensated by the system and has no effect on braking performance. Therefore as a rule no adjustment to the brakes will be required.
If resistance at the brake lever is spongy, then in all likelihood air has entered the brake lines. Since the brakes are of major importance to the overall safety of the trike, we urgently recommend that you contact a **specialist dealer** immediately to have him carry out the necessary checks.

CAUTION:
The vehicle must begin to slow down after the brake pedal has been depressed about one third of the way. Your specialist dealer will check for brake pad wear. If he fits new brake pads, and before you ride the vehicle, you should actuate the brake lever several times to ensure that the brake pistons return to their proper positions and so that brake lever travel readjusts itself.

D) HANDBRAKE

The full effect of the handbrake should be felt at the fourth click. If not, then access the linkage nuts depicted below to re-adjust. If this produces no results, then the brake pads will need to be replaced (Fig. 13).

If the handbrake is on, then the engine will not start. If the engine is running, then pulling the handbrake will stop the engine.

Fig. 13

E) CHECKING THE BRAKE FLUID LEVEL

The brake fluid reservoir for the front and rear brakes is situated beneath the plastic fuel tank. To check the brake fluid level you must first remove the tank.

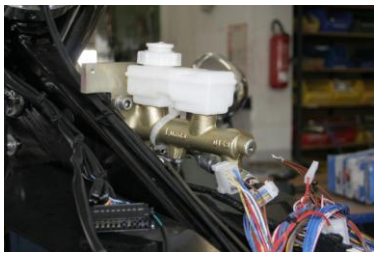


Fig. 14
The brake fluid level must always be between MIN and MAX markings.

If the brake fluid level has receded, then this can be due to brake pad wear. If the fluid is below the MIN marking, then you should contact a specialist dealer and have him carry out a thorough check of the braking system. If brake fluid is below the MIN marking, then the brake fluid warning light will go on.

TOPPING UP WITH BRAKE FLUID
Recommended brake fluid: **DOT 4 Lucas.**

Proceed as follows:
Remove the cover of the brake fluid reservoir. If necessary pull off the electrical connector. When topping up use only the brake fluid prescribed. Never exceed the upper marking (MAX).

USE ONLY DOT 4 BRAKE FLUID.

BRAKE FLUID IS A HAZARDOUS LIQUID. AVOID CONTACT WITH EYES, SKIN OR CLOTHING. IN THE EVENT OF CONTACT, IMMEDIATELY RINSE THE AFFECTED AREA THOROUGHLY WITH RUNNING WATER.

BRAKE FLUID IS HYGROSCOPIC, I.E. ABSORBS MOISTURE. IF BRAKE FLUID CONTAINS TOO MUCH MOISTURE, THEN BRAKING PERFORMANCE WILL DETERIORATE. NEVER USE BRAKE FLUID WHICH HAS BEEN STORED IN AN UNSEALED CONTAINER.

In a normal climate brake fluid should be changed every 12500 miles / 20,000 km, or at least every 2 years. Always contact a specialist dealer to let him carry out this task.
The brake fluid level, brake pad thickness, as well as the thickness of the discs should be checked at regular intervals.
! To ensure maximum braking performance from your brake discs, run them in over a distance of approximately 120 miles / 200 km.
During this period avoid making emergency stops.
After leaving a car wash, or in rainy and generally wet road conditions gently press the brake pedal to remove moisture from the disc **!**

3.1 FUEL SYSTEM, FUEL

Caution:
Petrol is highly inflammable, and under certain conditions can cause explosions. Always refuel in a well ventilated area, and make sure that the engine is off. Never smoke while refuelling or when in a fuel storage area; make sure that there are no naked flames nearby and that sparks cannot occur. Do not overfill the fuel tank. When you have finished refuelling, the pipe between the filler cap and the tank should be empty.
Make sure to close the filler cap properly. Do not spill any fuel. Petrol fumes and spilled petrol are easily ignited. In the event of spillage make sure that the area in question is dry before you restart the engine. Avoid repeated or prolonged contact with skin and do not inhale petrol fumes.

Keep out of reach of children!

Caution: Never let the engine's fuel pump run dry. This takes only a few seconds and damages the fuel pump beyond repair!

Fig. 15

The filler neck is beneath de upper part of the passenger back rest.

3.2 TYPE OF FUEL

Use only 95 octane petrol, unleaded

Caution: Vehicles equipped with a catalytic converter use unleaded petrol only. If by mistake you have filled up with leaded petrol (even a minor amount), then on no account start the engine, as this will damage the catalytic converter beyond repair.

BOOM TRIKES accept no responsibility for damage caused by the use of leaded petrol. Such damage shall be excluded from the conditions of warranty. If by mistake you have filled the tank with leaded fuel , then please contact an authorised BOOM TRIKES dealer, or a specialist dealer.

3.3 CATALYTIC CONVERTER

Never allow petrol to enter the catalytic converter, especially when the engine is hot:

- Never use up all the petrol in the fuel tank
- Avoid prolonged attempts at starting the engine
- Use battery jump leads
- Never turn off the ignition while the vehicle moving

Caution: If the ignition system malfunctions, or if performance is below normal, contact an authorised BOOM TRIKES dealer, or a specialist dealer. Do not use full throttle.

The catalytic converter is built into the exhaust silencer. Exhaust system temperatures can reach 1000 °C. Never park the vehicle in places where the surrounding vegetation can catch fire (woods, lawns etc.)

NEVER RIDE THE VEHICLE ON AN ALMOST EMPTY FUEL TANK. IF THE PETROL SUPPLY IS INTERRUPTED, DAMAGE MAY OCCUR TO THE CATALYTIC CONVERTER AND THE FUEL PUMP IS SURE TO BE DAMAGED BEYOND REPAIR.

USE OF A NON-RECOMMENDED FUEL NEGATIVELY AFFECTS THE PERFORMANCE OF THE EXHAUST AND FUEL SUPPLY SYSTEMS.

NEVER RUN THE VEHICLE UNTIL THE FUEL TANK IS COMPLETELY EMPTY. IF THIS OCCURS, DO NOT MAKE REPEATED ATTEMPTS AT STARTING THE ENGINE. TURN THE IGNITION TO THE "OFF" POSITION AND FILL UP WITH PETROL AS SOON AS POSSIBLE. FAILURE TO OBSERVE THESE INSTRUCTIONS CAN LEAD TO THE FUEL PUMP AND/OR CATALYTIC CONVERTER BEING DAMAGED BEYOND REPAIR.

YOU ARE STRONGLY ADVISED NOT TO USE FUEL FROM ANY OTHER SOURCES THAN NORMAL FILLING STATIONS. SUCH SUPPLIES MAY BE CONTAMINATED AND MAY DAMAGE THE FUEL SYSTEM'S PETROL FILTERS.

USE OF LUBRICANTS OTHER THAN THOSE WHICH HAVE BEEN RECOMMENDED CAN ACCELERATE WEAR IN THE ENGINE.

3.4 BATTERY (12 V – 18 AH)

The battery is the part of the electrical system requiring closest attention and care. The most important rules for maintaining a battery are as follows:

Maintenance-free batteries
First-time use of a maintenance-free battery:
Caring for a maintenance-free battery is confined to checking the battery voltage and if necessary charging the battery. Checking the battery voltage must be carried out before the vehicle is delivered. A disconnected battery kept in storage must be charged every 6 months. Prior to delivery of the vehicle, in addition to the maintenance above, you must check the voltage and charge the battery every 6 months.

Charging a disconnected battery kept in storage:

1) Checking the battery voltage
Before connecting the battery to a vehicle use a normal voltage tester to check the voltage of the disconnected battery
- If the battery voltage exceeds 12.6 V, you may connect the battery to the vehicle.
- If the battery voltage falls below 12.6 V, then charge the battery as described under 2).

2) Charging a battery at a constant voltage rate
- Charge at a constant voltage rate between 14.4 and 14.7 V
- Initial charging current: a 0.3 to 0.5 x nominal voltage

Duration of charge:
Recommended: 10 – 12 hours
Minimum: 6 hours
Maximum: 24 hours

NEVER REVERSE THE CONNECTIONS TO THE BATTERY TERMINALS: THIS WILL CAUSE SHORT CIRCUITING AND RISKS DAMAGING THE ELECTRICAL SYSTEM.

NEVER DISCONNECT THE BATTERY TERMINALS WHEN THE ENGINE IS RUNNING, AS THIS CAN CAUSE IRREPARABLE DAMAGE TO THE ELECTRONIC IGNITION SYSTEM

A SPENT BATTERY IS AN ENVIRONMENTAL HAZARD. RESPECT ENVIRONMENTAL LAWS AND DISPOSE OF IT IN AN APPROPRIATE CONTAINER.

If the vehicle is stationary for prolonged periods, then the battery will gradually discharge. This is due to natural discharging and due to consumers which are permanently supplied with electricity.

The rate at which the battery discharges also depends on ambient conditions and on whether the battery terminals are kept clean.

To avoid starting difficulties and severely damaging the battery, observe the following rules:

- **At least once a month:** start the engine and run it for 10 – 15 minutes at engine speeds slightly above idling speed. This keeps both the battery and the engine components in functional order.

- When you put the vehicle into storage (see instructions in the section „Putting the vehicle into storage“) remove the battery from the vehicle. Clean the battery, give it a full charge, and store it in a dry and well ventilated place. Charge the battery **at least once every two months**.

- A storage-battery is advisable, which gets connected with an adapter. Thereby the battery doesn’t has to be removed and can be installed at the charger during the storage.

3.5 ENGINE OIL LEVEL

On 4-stroke engines, engine oil lubricates the drive components, main bearings and all of the engine's moving parts. **Running an engine with insufficient oil can cause severe engine damage**.

On all 4-stroke engines, both oil consumption (to a certain degree) and gradual deterioration of oil properties are normal occurrences. The amount of oil an engine consumes is influenced heavily by the type of use the vehicle is put to, (for example prolonged periods of full throttle lead to increased oil consumption).

To avoid malfunctions, you should check the oil level at shorter intervals than those specified in the maintenance checklist, and prior to undertaking longer trips.
The vehicle is equipped with an oil pressure warning light (see page 23, point 3).

1. Checking the engine oil level:

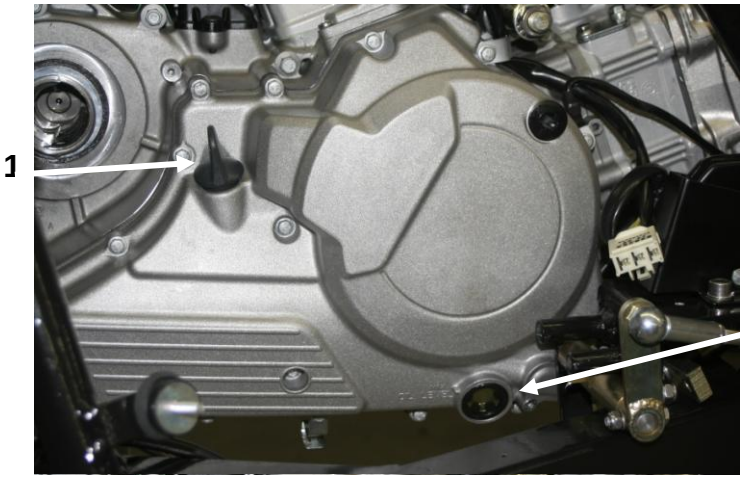


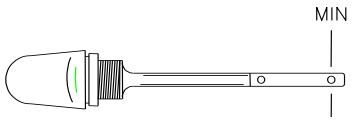
Fig. 16

1.) Place the vehicle on an even and level surface.

2.) Unscrew the filler cap with the dipstick (arrow 1), by using the "hook", which is fixed at the subframe, wipe with a clean cloth, replace the dipstick and screw in fully.

3.) Unscrew the dipstick again. Check the oil level. You can read only the minium oil level at the dipstick and the maximum oil level at the glass sight funnel (arrow 2). Maximum level: cast iron nose at engine block.

Oil at the MAX marking indicates that the engine contains approximately 2,6 ltrs. oil. If you check the oil when the engine is hot, then the oil level reading will be lower. Allow a hot engine to cool down for approximately 10 minutes before checking the oil.



2. Topping up with oil:

Always top up **after** checking the oil level, as the MAX marking should never be exceeded.
Approximately 0,3 ltr. of oil are needed for topping up from the MIN to the MAX marking (Fig. 17).
As part of the service plan the maintenance checklist specifies checking the oil level, and topping up if required, at intervals of every 1850 miles / 3000 km (see maintenance plan).

3. Oil pressure warning light (insufficient oil pressure)

The vehicle has an oil pressure warning light which goes on when you turn the ignition key. After the engine has started this warning light must go off.

If the oil pressure warning light goes on during braking, in neutral, or when you ride the trike around bends, then you should check the oil level and if necessary top up. If after topping up the engine oil the warning light stays on when performing the same riding manoeuvres, then you should contact a specialist dealer.

4. Oil change

Every 10000 km a specialist dealer should change the engine oil and the oil filter. Remove the sump plug on the drive side (Fig.18) and drain all the oil from the engine. Unscrew the dipstick to speed up draining (Fig. 16). Unscrew the oil filter cartridge and discard. Before fitting a new oil filter cartridge lubricate the rubber seal. After an oil change a certain amount oil always remains in the oilways, therefore you need only pour 2,3 ltrs.. of new oil in at the filler cap.
Next, start the engine and run it for several minutes and then stop it again. Wait 5 minutes and check the oil level again, if necessary top up. **Do not exceed the MAX marking on the dipstick**. Always change the oil filter along with the oil. For oil changes and topping up we recommend sythetic oil SAE 5 W 40.

3.6 CHANGING THE OIL FILTER

Caution:
Avoid contact with a hot engine as injury and burns may result

- Remove the exhaust silencer.
- Remove the dipstick and the oil drain plug.
- Remove the gauze filter from the oil drain plug and clean with a high-pressure air hose.
- Use a strap wrench to remove the filter cartridge.
- Check the condition of the O-rings on the gauze filter and on the oil drain plug.
- Lubricate the O-rings and screw the oil drain plug back in. Tighten to the correct torque.
- Before fitting a new oil filter cartridge lubricate the rubber seal. Hand-tighten the cartridge so that contact is made between the engine and the seal. Tighten to the correct torque.
- Replace the silencer.
- Pour in fresh oil as described above.

Torque settings: **Oil drain plug: 21 – 29 Nm** **Oil filter: 12 – 16 Nm**

INSUFFICIENT OIL OR USE OF THE WRONG OIL ACCELERATES WEAR OF MOVING PARTS AND CAN SEVERELY DAMAGE THE ENGINE.

RUNNING THE ENGINE WITH TOO MUCH OIL CAN LEAD TO MALFUNCTIONS OR MAY IMPAIR THE VEHICLE'S OVERALL PERFORMANCE.

USED OIL CONTAINS SUBSTANCES WHICH ARE HAZARDOUS TO THE ENVIRONMENT. A SPECIALIST DEALER SHOULD CARRY OUT THIS JOB, AS HE POSSESSES THE NECESSARY EQUIPMENT TO DISPOSE OF WASTE OIL IN COMPLIANCE WITH ENVIRONMENTAL LAWS.

USE OF LUBRICANTS AND/OR A SPARK PLUG OTHER THAN RECOMMENDED CAN CAUSE EXCESSIVE ENGINE WEAR.

3.7 DIFFERENTIAL GEARBOX

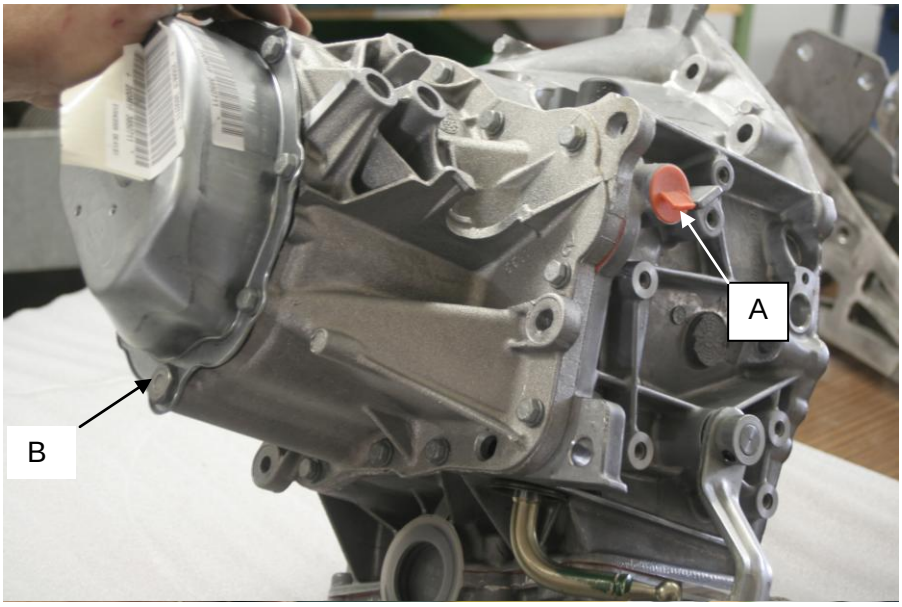
1. Gearbox oil level

To check the oil level in the differential gearbox (contains 1 litre), proceed as follows:

1. Place the vehicle on an even and level surface.
2. Unscrew inspection plug “A“ . If oil begins to run out then no topping up is required. If no oil runs out, then unscrew oil filler plug “B“ and carefully top up with oil until it begins to run out of inspection plug “A“. Screw both plugs back in and retighten.

The plug B is for draining the gearbox oil.

Fig. 17



Recommended oil grade: SAE 75 W 90

INSUFFICIENT OIL OR USE OF THE WRONG OIL IN THE DIFFERENTIAL GEARBOX ACCELERATES WEAR OF MOVING PARTS AND CAN SEVERELY DAMAGE THESE PARTS.

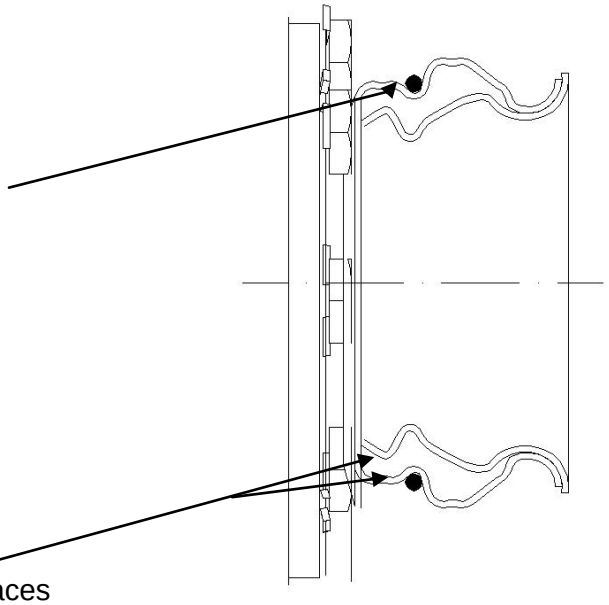
USED OIL CONTAINS SUBSTANCES WHICH ARE HAZARDOUS TO THE ENVIRONMENT. A SPECIALIST DEALER SHOULD CARRY OUT THIS JOB, AS HE POSSESSES THE NECESSARY EQUIPMENT TO DISPOSE OF WASTE OIL IN COMPLIANCE WITH ENVIRONMENTAL LAWS.

3.8 PINION UNIT

The lubrication of the connection is safed by a dual rubber sleeve.

The dual rubber sleeve guarantees reliability. The material of the sleeve is compatible with lubricants as well as with climatic conditions.

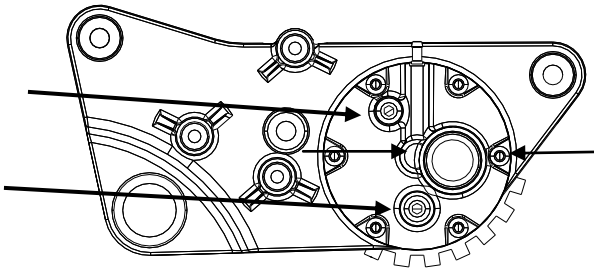
The fastening ring prevent deformation of the sleeve when rotating.



Notation for assembly:
Before starting assembly bestrew contact surfaces of the sleeve with dusting powder, so that a damage due to rubbing can be avoided!

Lubricants – funnel screw

Lubricants – drain screw



MAX
When filling up consider the MAX-mark.

Filling quantity:
approx. 90 ccm

Type: Rotra 80/90

Oil change: see maintenance intervals

3.9 BELT TENSION

1. For adjusting the belt tension the Allen screws 1, 2 and 3 must be unscrewed.
   Then unscrew the counter nut and cause the belt tension by rotating the adjusting screw “E” (tighten turnbuckles steady).
2. Now it should be possible to push the belt approx. 5 mm downwards.
3. Tighten the counter nut “D” and also the screws A, B, C. Check the tension by rotating the belt 1 – 2 turns.
4. Make a test drive and check the screws and the tension of the belt once more.

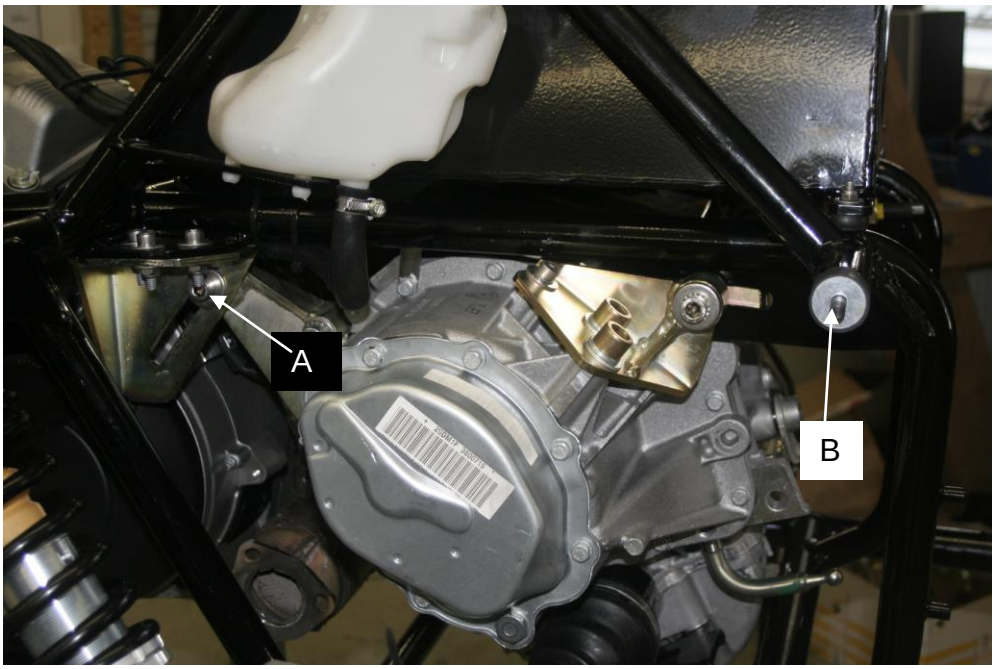


Fig. 18

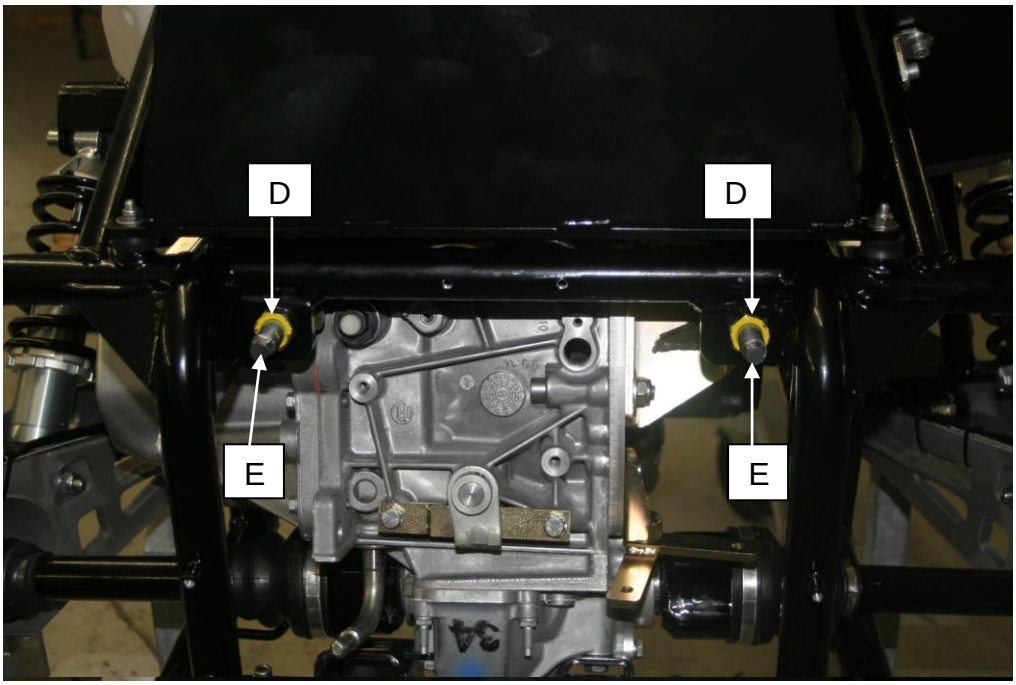


Fig. 19

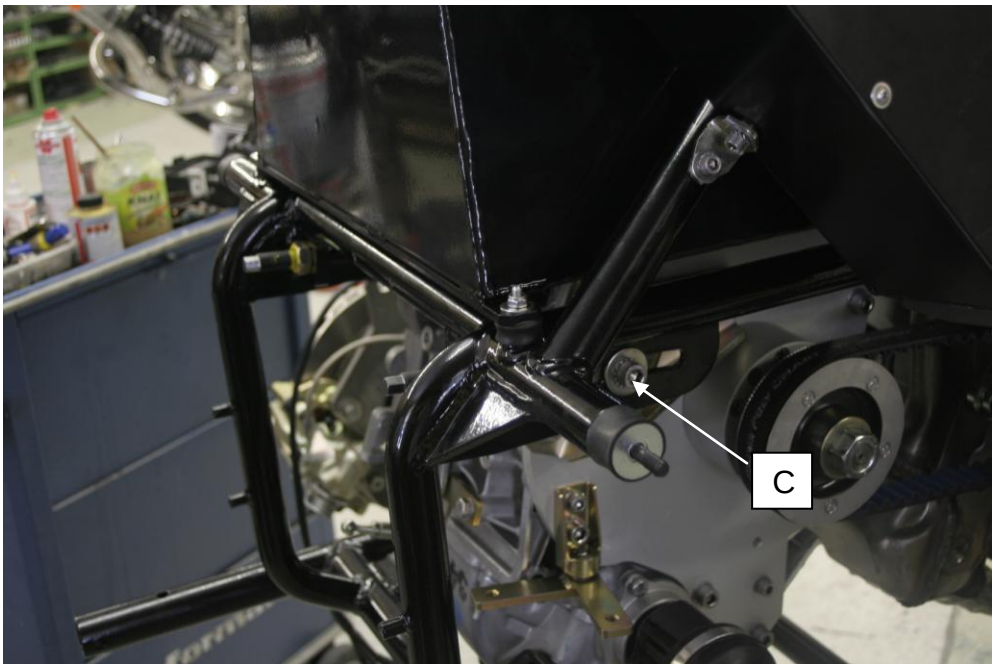


Fig. 20

4.0 REMOVING THE SPARK PLUG

To remove the spark plug proceed as follows:
1.) Open up the body section and lift.
2.) Remove the spark plug cap
3.) Unscrew the spark plug.
4.) Screw the plug back in at the correct angle **by hand**.
5.) Only use the plug spanner to tighten the plug down.
6.) Replace the plug cap by pushing it down as far as it will go.

Recommended makes:
NGK CR7 EKB
CHAMPION RG6YC

Plug gap:
0.7 – 0.9 mm

Torque setting:
Spark plug 10 - 14 Nm

Fig. 21

Fig. 22

Caution:
Only remove and replace the spark plug when the engine is cold!

Note:
USE OF A SPARK PLUG BY ANY OTHER MAKE THAN RECOMMENDED, OR OF UNSUPPRESSED SPARK PLUG CAPS CAN LEAD TO MALFUNCTIONS IN THE IGNITION SYSTEM .

ONLY REMOVE THE SPARK PLUG WHEN THE ENGINE IS COLD. CHECK THE SPARK PLUG EVERY 20000 KM, AND REPLACE IT IF NECESSARY. USE OF A DIFFERENT IGNITION SYSTEM OR OF A SPARK PLUG BY ANY OTHER MAKE THAN RECOMMENDED CAN SEVERELY DAMAGE THE ENGINE.

IF THE SPARK PLUG WAS REMOVED FOLLOWING ENGINE FLOODING (TO ALLOW PETROL TO EVAPORATE), THEN LEAVE THE PLUG CAP ATTACHED TO THE SPARK PLUG AND EARTH THE SPARK PLUG A GOOD DISTANCE FROM THE PLUG HOLE TO AVOID IGNITING THE MIXTURE COMING OUT OF THE CYLINDER HEAD.

4.1 REMOVING THE AIR FILTER

To remove the air filter proceed as follows:

1.) Demount the air filter and unscrew the cover, remove the air filter.
2.) Replace the air filter with a new part and afterwards refit in the inverse order.

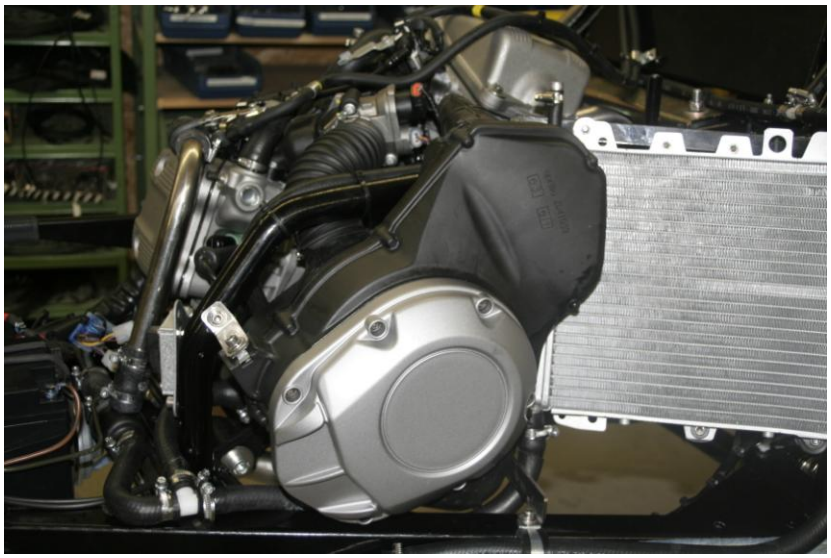


Fig. 23

The maintenance checklist specifies that the air filter should be checked every 3800 miles / 6000 km by a specialist and if necessary cleaned with a high-pressure air hose. Clean from the side fitted closest to the engine (the inside) as the outer side is where road dust collects.

IF THE VEHICLE IS FREQUENTLY USED ON DUSTY ROADS, THEN TO AVOID DAMAGING THE ENGINE YOU SHOULD CHECK THE AIR FILTER AT SHORTER INTERVALS THAN RECOMMENDED IN THE MAINTENANCE CHECKLIST.

4.2 CHECKING THE COOLING SYSTEM

The engine cooling system runs on a mixture of water and coolant, maintained under high pressure.

Total capacity is approximately 3.0 litres.

The coolant used **is ready-mixed and consists of 50% distilled water and 50% coolant**, which is an ethylene glycol mixture and contains anti-corrosion additives. Recommended coolant: **PARAFLU 11 FE**. This is ready for use and requires no additional diluting.

The coolant's optimum temperature range is between a minimum of 60°C and a maximum of 105°C, which will be shown on the water temperature gauge. If the red warning light goes on, then stop the engine immediately. Allow the engine to cool down and check the coolant level. If the level is correct then contact your specialist dealer.

PLEASE NOTE:
IF THE WARNING LIGHT GOES ON DURING NORMAL VEHICLE USE, THEN STOP THE ENGINE IMMEDIATELY AND ALLOW IT TO COOL DOWN. CHECK THE COOLANT LEVEL. IF THE LEVEL IS CORRECT THEN CONTACT YOUR SPECIALIST DEALER.

The coolant must be checked when the engine is cold. Proceed as follows:

a) Place the vehicle on an even and level surface.
b) Turn the filler cap of the expansion tank (1) anti-clockwise and remove.
c) The tank must be filled 2/3.
d) Top on if coolant is below 2/3.

Fig. 24

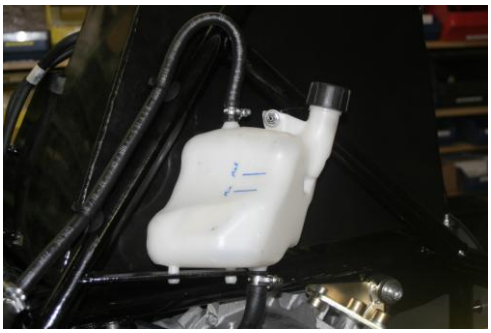


Fig. 25

The coolant expansion tank is installed on the left hand side of tank.

TO AVOID DANGEROUS LOSS OF COOLANT WHILE THE VEHICLE IS IN USE, ALWAYS MAKE SURE THAT COOLANT DOES NOT EXCEED THE MAX MARKING.

If coolant is close to the MIN marking, then it must be topped up. Only top up with coolant when the engine is cold. If frequent topping up is necessary, or if the expansion tank is completely empty, then you must take the vehicle to a specialist dealer for him to check the cooling system and rectify the fault.

TO MAINTAIN CORRECT ENGINE PERFORMANCE ALWAYS ENSURE THAT THE RADIATOR GRILL IS KEPT CLEAN.

IT'S NOT ALLOWED TO PUT ANY EQUIPMENTS OR LUGGAGE BEHIND THE COOLER, BECAUSE IT WOULD IMPEDE THE UPCOMING AIRFLOW AND THIS WOULD OVERHEAT THE ENGINE!

4.3 ADJUSTING THE HEADLAMPS

To adjust the headlamps proceed as follows:

1. Place the unladen and complete vehicle with correct tyre pressures on an even surface 10 metres away from a white wall slightly in the shade. The vehicle should point at right angles to the wall.

2. Draw a horizontal line on the wall, approximately 2 ft. 3 ins. / 67 – 70 cm high.

3. Switch on dipped beam and adjust the headlamp angle so that light meets the wall below this line.

Fig. 26

Fig. 27

Fig. 28

We recommend to take the vehicle to an authorised specialist to adjust the headlamps.

4.4 REAR-VIEW MIRRORS

To adjust a rear-view mirror, gently press a mirror edge and turn it in the direction required.

4.5 TOPCASE

Releasing and removing the topcase.

Fig. 29

For opening insert the red key inside the lock and turn it to the right through 90°.
Afterwards press the button “B“ until the lock jumps out. Now the cover can be opened.
The closing takes place in the inverse order.

To release the topcase, also open the lock with the red key and afterwards press button “A”.
Now the topcase ce be released. “C” = grap handle.

For cleaning and general care follow the manufacturer’s recommendations.

Do not load the topcase with more than 15 kg!

4.6 TYRES

Regularly check the tyre pressures!

FITTING TYRES OTHER THAN THOSE RECOMMENDED CAN LEAD TO UNSTABLE HANDLING. WE URGENTLY RECOMMEND THAT YOU ALWAYS FIT TYRES WHICH CONFORM TO THE ORIGINAL VEHICLE SPECIFICATIONS.

The tyres have tread markers to indicate the degree of wear. Replace the tyres as soon as these markers become visible on the tread. Check the tyres for damage, e.g. cuts or an uneven pattern of wear. To replace tyres, contact a specialist dealer or a tyre dealer with the necessary workshop equipment.

FRONT WHEEL: 2.3 bar – REAR WHEELS: 2.5 bar

PUNCTURES

This vehicle is equipped with tubeless tyres. If a puncture occurs then air takes much longer to escape than from a tube. On the roads this ensures a greater safety margin. Temporary repairs can effected by using a tyre repair foam, or a tyre repair kit for tubeless tyres.

REFER TO THE MANUFACTURER'S INSTRUCTIONS ON HOW TO USE TYRE REPAIR FOAM.

In order for permanent tyre repairs to be carried out, or in order to change a tyre we recommend that you contact a specialist dealer. In order to change a tyre the corresponding wheel will have to be removed. Contact your specialist dealer to have him carry out this job.

FRONT AND REAR WHEELS MUST ALWAYS BE BALANCED. RIDING A VEHICLE WITH UNBALANCED WHEELS OR WITH INCORRECT TYRE PRESSURES CAN LEAD TO ACCIDENTS.

4.7 CLEANING THE VEHICLE

Use water from a low-pressure hose to loosen road dirt and deposits on painted surfaces. When water has loosened the deposits, use a soft sponge along with ample water and a car shampoo (no more than 1 part shampoo to 25 parts water). Rinse off thoroughly with clear water and wipe down with a chamois leather rag. Clean the outside of the engine with paraffin, a brush and a clean rag. Paraffin causes damage to paintwork. Finally, apply a silicone wax finish, but only after you have finished washing the bodywork.

CLEANING AGENTS CONTAMINATE WATER RESOURCES. YOU SHOULD ONLY CLEAN THE VEHICLE IN PLACES WHICH HAVE SYSTEMS FOR RECYCLING WASTE WATER.

IF YOU USE A HIGH-PRESSURE WATER HOSE TO CLEAN THE ENGINE, THEN PLEASE OBSERVE THE FOLLOWING:

- Adjust the nozzle to a spray, do not use a narrow water jet.
- Hold the hose at least 2 feet / 60 cm away.
- Water should be no warmer than 40° C.
- Do not use a high-pressure water jet.
- Do not use a steam cleaner.
- Never aim the hose directly at the following parts: fuel injection system, electrical wiring, air intakes on the gearbox and flywheel covers, any electrical components, instruments, steering head.

Never wash the vehicle in direct sunlight, particularly in summer, when the bodywork has warmed up and shampoo bakes onto the surface before you can wipe it off. This can damage the paintwork. Never use rags with petrol or paraffin to clean the paintwork, as this affects the gloss and damages the surface's properties. Depending on the vehicle colour (satin colours), applying silicone wax may damage the paintwork. For more information ask your specialist dealer.

4.8 PUTTING THE VEHICLE INTO STORAGE

Before putting the vehicle into storage we recommend that you carry out the following:

1. Clean all parts of the vehicle and fully enclose it with a protective cover.
2. With the engine switched off and the piston at bottom dead centre, remove the spark plug and inject approximately 1 – 2 c.c. SELENIA HI Scooter 4Tech oil. Press the starter once or twice and screw the spark plug back in.
3. Fill up the fuel tank.
4. Observe the battery maintenance recommendations in section 3.6.

4.9 LIST OF LIGHT BULBS

Function	Type	Volts / Watts
Dipped beam	Halogen H4 / HB3 at Jet Light	2 x 12V-55W
Main beam	Halogen H4 / HB3 at Jet Light	2 x 12V-60W
Front parking light	All glass	2 x 12V-5W
Indicators, front	Bulb	2 x 12V-21W
Tail light	LED module	2 x 12V-10W
Brake light	Bulb	2 x 12V-21W
Indicators, rear	Bulb	2 x 12V-21W
Instrument lights	All glass	5 x 12V-2W
Number plate light	Cylindric	1 x 12 V-5W
Rear fog light	Bulb	1 x 12V-21W
Reverse light	Bulb	1 x 12V-21W
Headlight element	Without performance	

5.0 FUSES, RELAYS

ALWAYS FIND AND RECTIFY THE FAULT THAT LED TO A FUSE BLOWING BEFORE YOU REPLACE IT: NEVER USE ALTERNATIVE METHODS OF BRIDGING THE ELECTRICAL CIRCUIT (E.G. WIRE).

Fig. 30

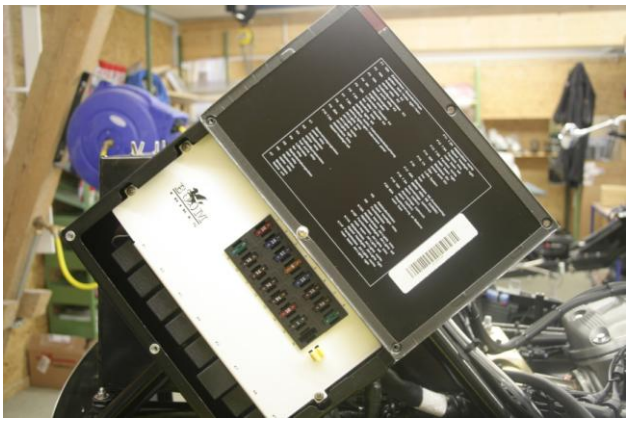


Fig. 31

Fuses and relays are located in the safe-box besides the engine.

Relays:
K1 = Power supply
K2 = Starter relay
K3 = Fuel pump relay
K4 = Fan relay
K5 = Upkeep relay
K6 = Starter (externally)
K7 = Indicator relay
K8 = Dipped headlights relay
K9 = Full beam relay

Relays underneath the plastic tank-dummy:

K10 = Dipped headlights Jet-Lights left
K10F = Full beam Jet-Lights left
K11A = Dipped headlights Jet-Lights right
K11F = Full beam Jet-Lights right

Fuses:	
F1 10A	Ignition lock/Brake light/Horn
F2 15A	Starter relay K2
F3 15A	Fuel pump relay K3
F4 5A	Engine control unit
F5 5A	Radiator fan relay/Decoder K4
F6 7.5A	Parking lights links
F7 7.5A	Parking lights right/Instruments lights
F8 30A	Jet-Lights left
F9 30A	Jet Lights right
F10 7.5A	Dipped headlights left
F11 7.5A	Dipped headlights right
F12 7.5A	Full beam left
F13 7.5A	Full beam right
F14	Free
F15	Free
F16	Free
F17 40 A	Starter relay K6 (externally)
F18 7.5A	Alarm system (facultative)
F19 15A	Alarm system (facultative)
F20 60A	Main fuse at battery

Also see page page 38 - 39

5.1 TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	SOLUTION
ENGINE WILL NOT START	Handbrake on Fuse blown	Release handbrake Replace fuse and contact specialist dealer
STARTING DIFFICULTIES	Fuel tank empty	Fill up with petrol
	Fuel injection system malfunction	Contact specialist dealer
	Damaged petrol pump	Contact specialist dealer
	Flat battery	Charge battery
LOW COMPRESSION	Defective electronic management/ fuel injection system	Always contact specialist dealer, as safety risks are involved when working on high voltage
	Loose spark plug	Tighten spark plug
	Cylinder head not tightened down properly, worn piston rings, sticking valves	Contact specialist dealer
HIGH PETROL CONSUMPTION AND LOW ENGINE PERFORMANCE	Air filter clogged	Clean with air hose, alternatively replace.
INADEQUATE BRAKING PERFORMANCE	Oil or grease on brake discs. Worn brake pads, old brake fluid, braking system malfunctioning.	Contact specialist dealer
INADEQUATE SUSPENSION	Shock absorber faulty, oil leaking, worn bump stop, wrong prestressing of the shock absorbers	Contact specialist dealer
PROBLEMS WITH AUTOMATIC GEARBOX	Worn pulleys or drive belt	Contact specialist dealer

IMPORTANT:
NEVER RUN THE VEHICLE UNTIL THE FUEL TANK IS COMPLETELY EMPTY. HOWEVER, IF THIS OCCURS, DO NOT MAKE REPEATED ATTEMPTS AT STARTING THE ENGINE. TURN THE IGNITION TO "OFF" AND FILL UP WITH PETROL AS SOON AS POSSIBLE. FAILURE TO OBSERVE THESE INSTRUCTIONS CAN LEAD TO THE FUEL PUMP AND/OR CATALYTIC CONVERTER BEING DAMAGED BEYOND REPAIR.

5.2 MAGCODE POWERSYSTEMPRO 12/24V

Important informations for the outdoor use of the Power System 12/24 V
(Hints by Company MagCode):
To extend the operational life span of this product, the following measures should be taken:
- after the outdoor use of the Port clean it quickly with a cloth
- from time to time remove cutting debris on the side of the contact of Port and Clip with an adhesive strip.
- Every 1 – 2 months spray some contact spray on Port- and Clip contacts.

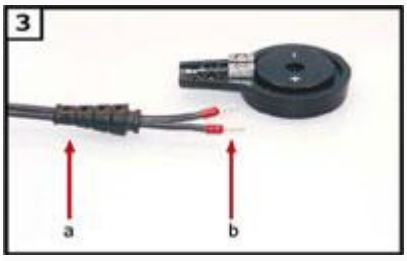
Attention:
The MagCode PowerSystemPro 12/24V is outfitted with a mechanic bayonet cap. It can be cut without unlocking under load, what can cause damages and/or a malfunction of the system. Thus always unlock manual!

NEW:
As of now available – retrofittabel problem-free:
Covering for Code PowerPort 12V/24V and MagCode PowerPortPro 12V/24V.
More detailed product informations (f. e. installation manual) on our Homepage (www.magcode.com).

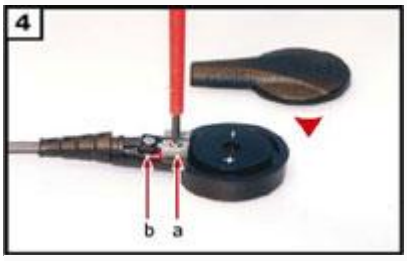
MagCode*PowerClip*

1. Cut-off existing plug - notice polarity.

2. Open **MagCode***PowerClip* and remove pull relief.



3. Cut grommet to size for thicker cables (3a) and apply multicore wiring sleeves (3b).



4. Fix cable ends in screw terminals (4a)(notice polarity) and mount pull relief (4b) and grommet.

5. Close housing with screw - Ready!

5.3 Wiring diagram - legend

	Power supply
F1 10A	Ignition lock/Brake light/Horn
F2 15A	Starter relay K2
F3 15A	Fuel pump relay K3
F4 5A	Engine control unit
F5 7.5A	Radiator fan relay/Decoder K4
F6 7.5A	Parking lights left
F7 7.5A	Parking lights right/Instruments lights
F8 30A	Jet-Lights left
F9 30A	Jet Lights right
F10 7.5A	Dipped headlights left
F11 7.5A	Dipped headlights right
F12 7.5A	Full beam left
F13 7.5A	Full beam right
F14	Free
F15	Free
F16	Free
F17 40 A	Starter relay K6 (externally)
F18 7.5A	Alarm system (facultative)
F19 15A	Alarm system (facultative)
F20 60A	Main fuse at battery

K1	Power relay
K2	Starter relay
K3	Fuel pump relay
K4	Radiator fan relay
K5	Upkeep relay
K6	Starter relay (externally)
K7	Indicator relay
K8	Dipped headlights relay
K9	Full beam relay
K10A	Dipped headlights relay Jet-Lights left
K10F	Full beam relay Jet-Lights left
K11A	Dipped headlights relay Jet-Lights right
K11F	Full beam relay Jet-Lights right

E15	Instruments lights
H10	Indicator control light
H12	Full beam control light
H20	Brakefluid control light
H21	Charging control light
H22	Oil pressure control light
U1	Reservoir gauge
U4	Rev counter
U5	Speedometer

6.0 TERMS OF WARRANTY / GENERAL CONDITIONS AND TERMS OF BUSINESS

I: Conditions - scope of application

Deliveries, services/performances and offers made by us shall be governed solely by the following general terms and conditions of business. These shall also be valid for all future business dealings, even if no express reference is made to them. These conditions shall be considered as accepted, at the latest, at the time of acceptance of the service rendered. Any reference by customers or suppliers to their own general terms and conditions and conditions of purchase which are contrary to the terms and conditions mentioned above, are hereby rejected.

II: Conclusion of a purchase agreement / transfer of the buyer's rights and obligations; resale of the object prior to receipt

1. The buyer is bound by the purchase order for a maximum of 4 weeks. A purchase agreement shall be considered concluded if, within the period stated above, the vendor confirms, in writing, that he has accepted a purchase order for a specific object, or if delivery has taken place. If the vendor does not accept the purchase order, however, he is obliged to inform the buyer without delay.
2. Any transfer of the buyer's rights and obligations arising from the purchase agreement, and any resale of the object prior to its receipt shall require the written permission of the vendor. In the case of a breach or attempted breach of this provision, the vendor may withdraw from the purchase agreement, in writing and without notice.

III: Prices

1. The price of the object of purchase is the manufacturer's price, plus delivery fees and VAT, the sum total being the purchase price. Additional services/ performances will be charged separately.
2. Following conclusion of the purchase agreement, the buyer is obliged to make a payment equal to 20 % of the goods' sale value. If the vendor does not receive the payment as agreed, then after issuing a reminder to pay the agreed sum within a reasonable period of time, he shall be entitled to withdraw from the purchase agreement or to claim indemnity from the buyer due to non-fulfilment of obligations.

IV: Payment

1. The purchase price and prices for additional services/performances shall be paid in full upon delivery of the object of purchase and upon delivery of the invoice or other billing documents personally or by any other means.
2. The buyer may offset the demands of the vendor only if the buyer's counterclaim is undisputed or on the basis of an existing legally enforceable claim. A right of retention may only be asserted on the basis of claims arising from the purchase agreement.

V: Delivery and delayed delivery

1. Delivery dates or delivery deadlines, which may be binding or non-binding subject to agreement, shall be confirmed in writing. Delivery deadlines apply from the date on which the purchase agreement is concluded.
2. If six weeks elapse after an agreed non-binding delivery date or non-binding delivery deadline without delivery of the ordered object, then the buyer is entitled to demand that the vendor deliver the object of purchase. The vendor shall be in default as from receipt of this demand. If the buyer is entitled to claim indemnity for damages arising from default, this will be restricted to a maximum of 5 % of the agreed purchase price in the case of ordinary negligence on the part of the vendor. If the buyer also decides to withdraw from the purchase agreement and/or claim indemnity in lieu of fulfilment, following expiry of the six-week deadline and in accordance with sentence 1, he is obliged to set the vendor a reasonable delivery deadline. If the buyer is entitled to claim indemnity in lieu of fulfilment, this shall be restricted to a maximum of 25 % of the agreed purchase price in the case of ordinary negligence on the part of the vendor; if the buyer is a legal entity in the public sector, or represents a public sector special fund, or is a business person who was acting in a commercial capacity or in his capacity as a self-employed person when he concluded the agreement, there shall be no entitlement to indemnity in the case of ordinary negligence. In the event of the vendor being unable to deliver the object of purchase through no fault of his own whilst still in default, he will be obliged to offer indemnity in accordance with the limitations stated above. The vendor shall not be liable to offer indemnity if the damages would have also occurred even if that fulfilment had taken place on time.
3. If a binding delivery date or a binding delivery deadline elapses without the purchase object being delivered, the vendor shall automatically be in default. The rights of the buyer shall then apply in accordance with Item 2, sentences 3 to 6 of this Section.
4. Acts of God, or disturbances affecting the business operations of the vendor or his supplier, which temporarily prevent the vendor through no fault of his own from delivering the object of purchase on the agreed date or by the agreed delivery deadline, have the effect of suspending the dates and deadlines stated in items 1 to 3 for the duration of the disturbance caused by such circumstances. If the disturbance causes fulfilment to be suspended for more than four months, the buyer shall be entitled to withdraw from the purchase agreement. All other rights in respect of withdrawal from the agreement shall remain unaffected.
5. The manufacturer shall reserve the right to alter the vehicle specifications, make modifications to the shape and colour, and to change the scope of the delivery, providing that, taking into account the interests of the vendor, the buyer can be reasonably expected to tolerate the aforesaid changes or modifications.
6. If the customer is a business person, then, unless he has previously obtained a written statement of our consent, he shall not be permitted to resell to countries outside the EU, either direct or indirectly, the goods which we have delivered.
7. All risks shall be transferred to the customer as soon as the goods are in the charge of the person responsible for their transport, or as soon as the goods have left the vendor's storage facilities for subsequent carriage and delivery.

VI: Acceptance of the object of purchase

1. The buyer is obliged to accept delivery of the object of purchase within 8 days following notification of delivery. In the event that the buyer does not accept delivery of the object of purchase the vendor is entitled to assert his legal rights in this connection.
2. If the vendor claims indemnity, this shall be equal to 15 % of the agreed purchase price. The final amount may vary, subject to the vendor proving damages to be greater, or the buyer proving damages to be less.

VII: Reservation of ownership

1. The object of purchase shall remain the property of the vendor until all rightful demands of the vendor arising from the purchase agreement are fulfilled. If the buyer is a legal entity in the public sector, or represents a public sector special fund, or is a business person who was acting in a commercial capacity or in his capacity as a self-employed person when he concluded the agreement, the same reservation of ownership also applies in respect of the vendor's demands towards the buyer in the ongoing business relationship, until such time as the vendor's rightful demands in connection with the said purchase have been fulfilled. If the buyer so requests, the vendor is obliged to renounce his reservation of ownership on condition that the buyer has indisputably fulfilled all the demands existing in connection with object of purchase, and on condition that adequate collateral exists as cover for other demands arising from an ongoing business relationship. For the time period in which he still has reservation of ownership, the vendor has the right of ownership of the vehicle registration documents.
2. In the case of default of payment on the part of the buyer, the vendor is entitled to withdraw from the purchase agreement. If the vendor is also entitled to claim indemnity in lieu of fulfilment and retakes possession of the object of purchase, then vendor and buyer agree that the vendor shall reimburse the normal resale value of the object of purchase at the time when the object is returned. At the request of the buyer, who is entitled to make such a request only immediately following return of the object of purchase, the buyer may select a publicly appointed and certified vehicle expert, e.g. from Deutsche Automobil Treuhand GmbH (DAT), in order to determine the normal resale value. The buyer shall bear all the costs in connection with the return and sale of the object of purchase. Unless proved otherwise, the additional costs for re-sale shall be equal to 5 % of the normal resale value. The final amount may vary, subject to the vendor providing proof of higher costs, or the buyer providing proof of lower costs.
3. For the time period in which the vendor retains the right of ownership, the buyer has no right to resell the object of purchase, nor may he contractually permit any third parties to make use of the object of purchase.

VIII: Material defects

1. With regard to material defects, in the case of new vehicles or new parts (excluding kits), in accordance with the provisions in law the buyer's warranty rights expire after two years following delivery of the object of purchase (exception: Item 7). In deviation from the above, in the case of new vehicles being used for rentals, and in the case of kits or export vehicles, warranty rights expire after one year if the buyer is a legal entity in the public sector, or represents a public sector special fund, or is a business person, who was acting in a commercial capacity or in his capacity as a self-employed person when he concluded the agreement.
In the case of used vehicles or used parts, the buyer's warranty rights in respect of material defects expire after one year following delivery of the object of purchase to the customer. In the case of malicious non-disclosure of the existence of defects, or agreement to grant a guarantee for the condition of the objects, all other rights remain unaffected.
2. With regard to the rectification of defects, the following shall apply:
a) The buyer has the right to demand rectification of defects by either the vendor or by any other recognised service centre appointed by the manufacturer/ importer to repair or carry out maintenance of the object of purchase; in the latter case the buyer is obliged to make this circumstance known to the vendor. In the case of the buyer informing the vendor verbally of claims, the vendor shall give written confirmation to the buyer that he has received appropriate notification.
b) If the object of purchase is out of working order due to a material defect, , the buyer may, subject to agreement by the vendor, seek help from a certified vehicle service centre capable of providing assistance and closest to the location of the object of purchase, on condition that the object of purchase which is out of working order is at a location over 100 km away from the vendor's facilities .
c) Parts which are removed and replaced shall become the property of the vendor.
d) The buyer shall be entitled to claim warranty rights for replacement parts fitted for the purpose of rectifying material defects up until expiry of those warranty rights arising from the purchase agreement which apply to the object of purchase.
3. Changes of ownership shall not affect the right to demand rectification of defects.
4. The vendor ensures that the object of purchase has been manufactured in accordance with recognised technical guidelines based on the technologies employed in limited series manufacturing, and not in mass production.
5. If the buyer does not observe the manufacturer's operating and maintenance instructions, or uses replacement parts or materials/fluids/lubricants which do not conform to the original specifications, he shall forfeit all warranty rights.
6. In the case of excessive and improper use of the object of purchase, i.e. use in motor sporting events, or for example excessive off-road use etc., the buyer shall also forfeit all warranty rights.
7. In the case of reconditioned engines, and reconditioned or used gearboxes, even if fitted to new vehicles, any warranty rights applying to material defects shall always expire after a period of 12 months, regardless of whether the buyer is a private customer or a business person.
8. Acceptance of a job order to carry out repairs is not in itself tantamount to accepting the customer's demand for recognition of warranty rights.
9. Rules of maintenance:
a) General notes and instructions:
All fibreglass parts are laminated by hand, therefore minor irregularities in shape and deviations in colour must necessarily be tolerated by the customer. Uneven tyre wear is inherently caused by the nature of the vehicle's constructional design. Trike and motorcycle riders should always wear suitable protective gear (full-face helmet, leathers, leather boots, leather gloves).

b) Maintenance intervals:
The following vehicle maintenance and servicing intervals should be observed:
a) after 500 km, or at the latest 4 weeks after purchase of the vehicle
bb) after 5000 km, or at the latest 3 months after purchase of the vehicle
cc) after 10000 km, or at the latest 6 months after purchase of the vehicle
dd) and annually for every subsequent 5000 km
ee) For Fighter, Muscle, Fun 500, V2 models a separate maintenance guide applies

c) Operating instructions:
Before each journey you must:

aa) check the oil level
bb) check the tyre pressures
cc) check the petrol tank for sufficient fuel
dd) check for play in the steering head bearings (the forks may only be dismantled by the manufacturer)
ee) check the brake fluid level
ff) check that all lights are in working order
gg) check that all external vehicle parts are secure.

IX: Liability

1. If the vendor is legally required to pay compensation for damage resulting from ordinary negligence, and taking into consideration these terms and conditions, the extent of his liability shall be limited as follows:
The vendor shall only be liable if he has neglected important obligations arising from the purchase agreement, and shall only be liable to compensate for damage of a typical nature and of a kind which is foreseeable at the time of the purchase agreement was concluded. This limitation does not apply in the case of bodily harm and damage to life and health. Insofar as the damage is covered by an insurance taken out by the buyer (excepting endowment insurance), the vendor shall be liable only for subsequent disadvantages experienced by the buyer, e.g. higher insurance premiums, or lost interest until such time as a settlement has been effected by the insurance company. The vendor shall not be liable for any damage resulting from defects to the object of purchase arising out of ordinary negligence.
2. Regardless of whether the vendor is at fault or not, in the case of malicious non-disclosure of the existence of defects, as arising due to acceptance of a guarantee or a purchase risk and in accordance with product liability law, any liability on the part of the vendor shall remain unaffected.
3. With regard to the question of liability arising out of delayed delivery, Section V shall apply.
4. Legal representatives, persons carrying out obligations for the vendor, and the vendor's business associates shall under no circumstances be made personally liable for damage as a result of ordinary negligence on their part, respectively.

X: Vehicle expert arbitration proceedings (applies only to used vehicles)

1. If the motor vehicle company bears the membership insignia of the guild of certified motor vehicle experts "Meisterbetrieb der Kfz-Innung", in the case of any disputes concerning the purchase agreement – except for disagreement over the purchase price – the parties may call upon the arbitrator appointed at the vendor's place of business to mediate in affairs concerning motor vehicles or concerning the trading of used vehicles. The application calling upon the arbitrator to mediate must be made in writing and must be filed immediately as soon as the point at issue becomes known, or at the latest, prior to 13 months after delivery of the object of purchase.
2. The decision of the arbitrator shall not prevent the parties from referring the matter to a court of law.
3. In the event that the arbitrator is called upon to mediate, the statutory period of limitation is suspended for the duration of the arbitration proceedings.
4. The arbitration proceedings are governed by the respective rules and regulations and codes of procedure, which may be presented to the disputing parties at their request.
5. It is not possible to call upon the arbitrator to mediate if the matter has already been referred to a court of law. If the parties refer the matter to a court of law while arbitration is ongoing, the arbitrator will terminate his proceedings.
6. The instigator of the arbitration proceedings is not required to pay the arbitrator any fees.

XI: Place of fulfilment, place of jurisdiction and applicable law

1. The place of fulfilment in respect of delivery of the object of purchase is the place of business of the vendor.

2. The place of business of the vendor shall be the sole place of jurisdiction in connection with all current and future claims arising from business dealings with business persons, including claims in connection with bills of exchange or cheques.

3. The same place of jurisdiction applies if no general place of jurisdiction in Germany applies in the case of the buyer, or if his place of abode or the place where he is ordinarily resident ceases to be Germany after conclusion of the purchase agreement, or if his place of abode or his ordinary place of residence at the time of commencement of legal proceedings is not known. In the case of the vendor filing claims against the buyer, the place of jurisdiction is the place of abode of the buyer.

4. The UN Convention on the International Sale of Goods dated 11 April 1980 does not apply here.

7.0 SERVICE BOOKLET

Warranty*
2 years
***Exception rental Trikes:**
1 year

Detachable stub for manufacturer (to be sent to BOOM TRIKES at the latest 2 weeks after the service date)

1.000 km Service	
Or at the latest **4 months** after vehicle purchase. Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

1.000 km Service	
Or at the latest **4 months** after vehicle purchase. Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

10.000 km Service	
Or at the latest **12 months** after vehicle purchase. Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

10.000 km Service	
Or at the latest **12 months** after vehicle purchase. Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

20.000 km Service	
Or at the latest **24 months** after vehicle purchase. Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

20.000 km Service	
Or at the latest **24 months** after vehicle purchase. Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

30.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

30.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

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Name:	
Street:	
Zip/Place:	
Phone:	
Date of first registration:	
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Date of first registration:	
Date of purchase:	
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40.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

40.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

50.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

50.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

60.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

60.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

70.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

70.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

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Date of first registration:	
Date of purchase:	
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80.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

80.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

90.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

90.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

100.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

100.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

110.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

110.000 km Service	
Dealer's stamp:	
Name:	Chassis no.:
Mileage:	Date:

Name:	
Street:	
Zip/Place:	
Phone:	
Date of first registration:	
Date of purchase:	
At:	

Name:	
Street:	
Zip/Place:	
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8.0 MAINTENANCE AND SERVICE INTERVALS

Maintenance should only be carried out by a specialist car dealer, a specialist motorcycle dealer (Piaggio or Aprilia) or by an authorised BOOM dealer.

The following service instructions assume that the trike is used exclusively as the manufacturer originally intended. If you ride it at consistently high engine speeds, or in unusually wet or dusty conditions, or rent the vehicle out, then it will require attention at shorter intervals than those specified in the service booklet.
Your authorised BOOM TRIKES dealer will be able to advise you on an appropriate service itinerary for your trike.

Regular servicing will ensure that your trike maintains its value and roadworthiness. A worldwide network of over 100 BOOM Trikes dealers and several thousand car and motorcycle dealers is at your disposal to ensure that your trike can always be properly maintained.

Check ■ Replace ●	**x 1000 km**	**1**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**
	months	**4**	**12**	**24**										
Engine oil	*Oil level check / Change oil*	Every 3000 km												
Engine oil	*Change oil*	●	●	●	●	●	●	●	●	●	●	●	●	●
Gearbox oil (Differential gearbox)	*Check oil level / change oil*	■	■	■	■	■	■	■	●	■	■	■	■	■
Spark plug/ plug gap	*Check / replace*		■	●	■	●	■	●	■	●	■	●	■	●
Air filter	*Replace / clean*		■	●	●	●	■	●	■	●	■	●	■	●
Oil filter	*Replace*		●		●		●		●		●		●	
Petrol filter	*Check / replace*					■				●				■
Valve clearances 0.15 mm (all valves)	*Check /adjust*	■			■			■			■			■
Petrol mixture	*Check / adjust*	■		■		■		■		■		■		■
Denseness / Wiring fuel injection	*Visual inspection*	■		■		■		■		■		■		■
Oil sump breather	*Visual inspection*	■	■	■	■	■	■	■	■	■	■	■	■	■
Variators	*Replace*			●		●		●		●		●		●
Curved track shoes	*Check / replace*			■		●		■		●		■		●
Bush, driven belt pulley	*Check / grease*					■				■				■
Drive belt	*Replace*		■	●	■	●	■	●	■	●	■	●	■	●
Coolant level	*Check*	■	■	■	■	■	■	■	■	■	■	■	■	■
Coolant	*Replace*	Every 2 years												
Radiator	*Clean exterior / check*	■	■	■	■	■	■	■	■	■	■	■	■	■
Lenkkopflager	*Check / grease*	■	■	■	■	■	■	■	■	■	■	■	■	■
Oil pinion unit	*Change*	■		●		●		●		●		●		●
Brake pads	*Check condition and wear*	Every 3000 km												
Chain / pinion	*Check, cleaning*	■	■	■	●	■	■	●	■	■	●	■	■	●
	Greasing	■	■	■	■	■	■	■	■	■	■	■	■	■
Brake fluid level	*Check*	■	■	■	■	■	■	■	■	■	■	■	■	■
Brake fluid	*Replace*	Every 2 years												
Torque settings	*Check*	■		■		■		■		■		■		■
Suspension, front and rear, springs, dampers	*Check*	■		■		■		■		■		■		■
Fork oil (only Telescopic fork)	*Check / replace*	■	■	■	■	■	■	●	■	■	■	■	■	●
Electr. system, battery	*Check*	■	■	■	■	■	■	■	■	■	■	■	■	■
Headlamps	*Check / adjust*			■		■		■		■		■		■
Tyres	*Check pressures & tread wear*		■	■	■	■	■	■	■	■	■	■	■	■
Vehicle and brake test	*Test ride*	■	■	■	■	■	■	■	■	■	■	■	■	■

(For a list of recommended lubricants see page 1)

TECHNICAL SPECIFICATIONS, LIQUID-COOLED 4-STROKE, 4-VALVE, 839 C.C. ENGINE

ENGINE

Type:	2 - cylinder 4-stroke
Bore:	88 mm
Stroke:	69 mm
Cubic capacity:	839 c.c.
Compression ratio:	10.5 : 1 ± 0,5
Valve train:	Single overhead camshaft, chain-driven from the alternator side, integrated camshaft sensor (tone wheel), 4 valves and automatic valve lifter for starting
Valve clearances:	Inlet : 0.15 mm Exhaust: 0.15 mm
Valve adjustment	Tappet adjusters on rocker arms
Idling speed:	1250 ± 50 rpm
Starter:	Electric starter motor
Lubrication:	Trochoidal oil pump in crankcase, oil filter, bypass regulates oil pressure
Oil pressure:	3,5 - 4 bar
Lowest permissible oil pressure (at 100° C)	0.8 bar
Carburation:	Electronic fuel injection, electrical fuel pump, ∅38 mm choke, individual fuel injectors
Max. power (at crankshaft)	51,8 kW (70 bhp) at 7,750 rpm
Max. torque / rpm	71 Nm at 4,500 rpm
Cooling system	Liquid cooled engine, crankshaft driven water pump, 3-way thermostat and fan
Power train	automatic gearbox with conical pulleys, belt drive, automatic clutch, reduction gear unit and fan in drive housing Secondary reduction with oil bath gear train on chain to differential
Ignition	Inductive ignition system integrated into fuel injection system, variable ignition timing and separate ignition coil
Ignition timing	Variable, FI-controlled
Spark plug	CHAMPION RG 6 YC, NGK CR 7 EKB
Engine oil	Fully synthetic oil SAE 5W/40, must exceed API SY
Oil capacity:	~ 2.6 ltrs.
Cooling system, capacity:	~ 3.0 ltrs.

Checking for top dead centre (TDC)

- Use a Torx key to open the inspection cover on the alternator cover.
- Remove the drive belt cover and its damping material.
- Remove the rocker cover on the cylinder head.
- Rotate the crankshaft at the pulley until the marking at the magnet holder points to the marking on the alternator cover (TDC).
- Make sure that the marking at the camshaft sensor points to the marking on the cylinder head. If it points in the opposite direction, then rotate the crankshaft through 360º again.

Checking and adjusting the valve clearances

- Only check and adjust the valve clearances when the engine is cold.
- Before checking the valve clearances ensure that you have obtained top dead centre as described in the section above.
- Use a feeler gauge and insert it in the gap between the valve adjuster and the valve. If one or more gaps deviate from the clearances specified below, then adjust the inlet and exhaust sides of the cylinder head accordingly. Loosen the locknut and turn the adjuster as depicted in the diagram.

- Inlet valve: 0.15 mm (cold)
- Exhaust valve: 0.15 mm (cold)

Checking engine compression

- On a cold engine, remove the spark plug cap.
- Unscrew the spark plug.
- Using a 10 mm adapter, screw a compression gauge into the plug hole and tighten down to the correct torque.
- Press the starter, and with the twistgrip open at full throttle rotate the crankshaft until the compression gauge readings no longer fluctuate. Check if the reading equals the prescribed value of 8 ± 1 bar. If so, then remove the compression gauge and screw the spark plug back in.
- If the readings are lower, then check the engine speed when you press the starter. If the engine speed is less than 450 rpm, then check the electric starter. If the engine speed is equal to the above value or slightly higher, i.e. is correct, then check for correct valve timing.
- Check if the correct barrel gasket has been fitted.
- Check for worn piston rings, sticking valves etc.

Torque setting:
Compression gauge adapter: 10 Nm

Recommended torque settings

Standard torque settings in Nm:

All values in Nm			
Thread diameter of bolt	Bolted to plastic surfaces with a metal washer	Bolted to bronze, copper, aluminium surfaces and various alloys	Bolted to iron and steel surfaces
M4	2	2	3
M5	4	4	6
M6	6.5	6.5	10.5
M7		10.5	17
M8		16	26
M9			52
M10			100
M14			145

Lubrication

Vehicle component	Torque setting (Nm)
Engine oil drain plug	**21 ÷ 29**
Screws divider oil pump	**3 ÷ 4**
Chain tensioner rest oil pump chain	**12 ÷ 16**
Screw oil pump	**5 ÷ 6**
Bloy-By line fixing screw	**11 ÷ 13**
Upper divider lubricant circuit	**3 ÷ 4**
Screw drive sprocket oil pump	**10 ÷ 14**
Fixing screw oil pump at housing	**5 ÷ 6**
Oil pressure sensor	**10**
Fixing screw cogwheel water pump	**5 ÷ 6**

Thermal unit and valve control

Vehicle component	Torque setting (Nm)
Spark plug	**12 ÷ 14**
Setscrew cylinder head fixture	***
Cylinder head nut	**10 ÷ 12**
Fixing screws cylinder head inlet/outlet	**10 ÷ 12**
Controlling nozzle lubrication cylinder head	**5 ÷ 7**
Fixing screw guide shoe, chain tension shoe	**10 ÷ 14**
Fixing screw injection nozzle	**3 ÷ 4**
Fixing screw intake manifold	**11 ÷ 13**
Fixing screw tappet covering	**7 ÷ 9**
Fixing screw throttle body	**11 ÷ 13**
Fixing screw camshaft holder	**4 ÷ 6**
Fixing screw cylinder head	**10 ÷ 12**
Coolant temperature sensor	**21 ÷ 23**
Fixing screw speed phase sensor	**7,5 ÷ 8,5**
Screw chain tensioner valve control	**11 ÷ 13**
Screw sprocket valve control at camshaft	**12 ÷ 14**

*** First time tighten crosswise with 10 Nm – then tighten crosswise with a torque of 13 Nm +90° – once again tighten crosswise with 90°.

Drive lid

Vehicle component	Torque setting (Nm)
Nut drive pulley	**252 ÷ 278**
Nut conducted pulley	**252 ÷ 278**
Clutch threaded ring	**65 ÷ 75**
Screws outer drive cover	**5 ÷ 7**
Screws innter drive cover	**11 ÷ 13**
Screws bargeboard	**3 ÷ 4**
Screws grill air outlet	**3 ÷ 4**

Alternator lid

Vehicle component	Torque setting (Nm)
Fixing screw flywheel	**116 ÷ 128**
Fixing stator	**8 ÷ 10**
Fixing screws freewheel	**13 ÷ 15**
Screws alternator	**11 ÷ 13**

Housing and crankshaft

Vehicle component	Torque setting (Nm)
Tab washer starter sprocket	**3 ÷ 4**
Connecting bolt housing (M6)	**11 ÷ 13**
Connecting bolt housing (M8)	**25 ÷ 28**

Cooling

Vehicle component	Torque setting (Nm)
Lid impeller water pump	**3 ÷ 4**
Vent screw	**3 ÷ 4**
Impeller water pump	**4 ÷ 5**
Fixing screw protecting plate water pump-cogs	**3 ÷ 4**

Frame

Vehicle component	Torque setting (Nm)
Nut bolt sidestand	**37**
Fixing screw cylinder head exhaust manifold	**16 ÷ 18**
Fixing screw catalyser / catalyser-holder	**22 ÷ 24**
Fixing screw silencer	**22**
Fixing clamp exhaust manifold	**16 ÷ 18**

Cog-unit

Vehicle component	Torque setting (Nm)
Screw tab washer cog catch-bush	**4 ÷ 6**
Fixing screws cog-unit lid	**4 ÷ 5**
Fixing screws cog-unit – frame	**50**

Misceallaneous torques

Vehicle component	Torque setting (Nm)
Thermostat lid	**1,5 ÷ 2**
Fixture injection nozzle holder (■)	**3 ÷ 4**
Control nozzle cylinder head lubrication	**5 ÷ 7**

(■) add LOCTITE 242 screwlock

9.0 PRE-DELIVERY VEHICLE CHECKS

Vehicle checks

- ❍ Paintwork
- ❍ Panel gaps, bodywork parts
- ❍ Vehicle damage
- ❍ All surfaces clean

Torque settings

- ❍ Torque settings in safety-relevant areas
- ❍ Securing bolts

Electrical system

- ❍ Ignition switch
- ❍ Headlamp angle in accordance with legal requirements
- ❍ Tail light, parking light, brake light
- ❍ Indicators and indicator warning light
- ❍ Instrument panel lights
- ❍ Instruments: petrol gauge and water temperature gauge
- ❍ Warning lights
- ❍ Horn
- ❍ Hazard warning lights
- ❍ Engine cutout function actuated by handbrake

Fluids and lubricants

- ❍ Petrol in fuel tank
- ❍ Brake fluid level
- ❍ Differential gearbox, oil level
- ❍ Engine oil level
- ❍ Coolant level

Test ride

- ❍ Cold start
- ❍ All instruments in working order
- ❍ Throttle response
- ❍ Vehicle stability when accelerating and braking
- ❍ Braking performance, front and rear brakes
- ❍ Damping, front and rear
- ❍ Excessive noise
- ❍ Checking proper chain tension and automatic chain lubrication

Vehicle checks after test ride

- ❍ Warm start
- ❍ Even idling speed (turn handlebars from lock to lock)
- ❍ Free and even handlebar movements
- ❍ Steering head bearings for play. No knocking should be felt.

Vehicle function checks

- ❍ Braking
  Brake lever travel
- ❍ Clutch
  Function checks
- ❍ Engine
  Throttle cable adjustment
- ❍ Other:
  - ❍ Check vehicle documents
  - ❍ Check frame and engine numbers
  - ❍ Check toolkit
  - ❍ Fit number plate
  - ❍ Check locks
  - ❍ Check tyre pressures
  - ❍ Fit rear-view mirrors and any optional extras